

Appl. No. 10/027,175
Amdt. dated July 15, 2004
Reply to Office Action of January 15, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 6 (currently amended): A high shear rotating disc filter assembly in a filtering system for filtering a slurry comprised of liquid and very small particles, said filtering system having at least a feed tank with a slurry input means, a slurry output means, and a slurry recycle input means, a receiver tank, and a vacuum pump, comprising:

a plurality of rotating discs constructed of a porous material, each said disc having a hollow interior, each said disk being mounted on ~~a~~ an elongated cylindrical shaft, wherein each disc has a round outer perimeter, a central radial opening, a first surface and an opposite second surface, said outer perimeter defining a disc radial plane, said surfaces, perimeter and central opening defining a disc interior, each said disc having a radial plane perpendicular to [the] a longitudinal axis of the shaft, each said disc interior opening onto the

Appl. No. 10/027,175

Amdt. dated July 15, 2004

Reply to Office Action of January 15, 2004

central opening, wherein each said disc has a hollow, disc-shaped hub insert with an outer perimeter fitted to and within each disc central radial opening, said hub perimeter having apertures formed therein establishing an opening between the disc interior and a hub interior, each hub having a central radial opening adapted to be fitted onto and about ~~[the]~~ a shaft cylindrical wall, ~~[each hub having an impervious first surface and an impervious second surface, said surfaces, perimeter and central opening defining the hub hollow interior,]~~ wherein each said hub insert has a central neck formed on each surface about the central opening, said necks adapted to abut and fit against an adjacent hub neck;

a liquid-tight vessel enclosing said discs, said vessel being connected to said feed tank slurry output means for receiving said slurry, said feed tank having an output means connected to said feed tank slurry recycle input means, wherein said vessel has a top, a bottom, and a side wall extending

Appl. No. 10/027,175

Amdt. dated July 15, 2004

Reply to Office Action of January 15, 2004

vertically upward from the bottom to the top, said bottom, top and interconnecting side wall defining a vessel interior, said vessel top and bottom defining a vessel vertical axis, wherein said slurry is pumped from the feed tank to a vessel inlet located at the vessel bottom, said slurry being fed continuously so as to affect an overflow at the top of the vessel, said vessel top having a recycle outlet which is piped back to the feed tank top slurry recycle input means;

~~[an elongated shaft for holding said discs,]~~ said shaft having a hollow interior, said shaft having a first end and a second end, said ends defining an elongated, longitudinal shaft axis, said second end being connected to said vacuum pump and said receiver tank, said first end being connected to a rotational drive means, said shaft having a plurality of elongated slots opening into said shaft hollow interior and into said disc interiors, wherein, the shaft first and second ends protrude through ~~[the]~~ a shaft side wall, wherein said portion of said shaft holding said discs is

Appl. No. 10/027,175

Amdt. dated July 15, 2004

Reply to Office Action of January 15, 2004

positioned within the vessel so that the shaft longitudinal axis is perpendicular to the vessel vertical axis, wherein said shaft is further defined by a generally cylindrical wall with a plurality of elongated slots formed therein, each said slot opening into said shaft hollow interior, each said elongated slot having a longitudinal axis parallel with the longitudinal axis of the shaft;

~~(a liquid tight vessel enclosing said discs and a portion of said shaft holding said discs, said vessel being connected to said feed tank slurry output means for receiving said slurry, said feed tank having an output means connected to said feed tank slurry recycle input means, wherein said vessel has a top, a bottom, and a side wall extending vertically upward from the bottom to the top, said bottom, top and interconnecting side wall defining a vessel interior, said vessel top and bottom defining a vessel vertical axis, wherein, said slurry is pumped from the feed tank to a vessel inlet located at the vessel bottom, said slurry being fed~~

Appl. No. 10/027,175
Amdt. dated July 15, 2004
Reply to Office Action of January 15, 2004

~~continuously so as to affect an overflow at the top
of the vessel, said vessel top having a recycle
outlet which is piped back to the feed tank top
slurry recycle input means;~~

wherein, said ~~[a]~~ plurality of discs with hub inserts
are stacked against each other onto said shaft,
each hub neck abutting and fitting against an
adjacent hub neck;

wherein, said vacuum pump is adapted to draw the slurry
from the vessel bottom through said plurality of
discs and through said shaft.

Claim 7 (original): A high shear rotating disc filter assembly as
recited in claim 6, further comprising:

an elastomeric seal installed between each abutting hub
neck to insure liquid-tight junctions.

Appl. No. 10/027,175
Amdt. dated July 15, 2004
Reply to Office Action of January 15, 2004

Claim 8 (original): A high shear rotating disc filter assembly as recited in claim 7, further comprising:

said shaft cylindrical wall has an elongated flat surface strip parallel to the longitudinal axis of the shaft;

each hub insert central radial opening having a flat portion corresponding to said shaft elongated flat surface strip.

Claim 9 (original): A high shear rotating disc filter assembly as recited in claim 8, further comprising:

a special seal installed about the shaft wall where the shaft protrudes through the vessel side wall.

Claim 10 (original): A high shear rotating disc filter assembly as recited in claim 9, further comprising:

a diffuser plug may be installed at the inlet entry point of the vessel bottom, said diffuser plug adapted to evenly disperse slurry flow as slurry enters the vessel.

Appl. No. 10/027,175
Amdt. dated July 15, 2004
Reply to Office Action of January 15, 2004

Claim 11 (original): A high shear rotating disc filter assembly
as recited in claim 10, wherein:

each filter disc is tapered with a greater separation
between surfaces adjacent the central radial
opening than at the outer perimeter.

Claim 12 (original): A high shear rotating disc filter assembly
as recited in claim 11, wherein:

said disc porous material is sintered metal.

Claim 13 (original): A high shear rotating disc filter assembly
as recited in claim 12, wherein:

said disc porous material is ceramic with finely
structured openings.